What is claimed is:

1. An improved air conditioner system for controlling a desired temperature and a reduced humidity level in a space to be environmentally controlled, the air conditioner system comprising:

a first air flow path through which, outside ambient air flows;

a second air flow path for processing air from a space to be environmentally controlled back to the space;

said first air flow path being separate from said second air flow;

refrigerant circuit means for circulating a refrigerant fluid through heat exchangers in the first and second air flow paths, the refrigerant circuit means including a compressor;

the first air flow path comprising an ambient outdoor air inlet means in air flow communication with forced air flow means for directing the flow of outdoor ambient air through the first air flow path and for discharging said ambient outdoor air through ambient outdoor air discharge means;

heat exchanger means for transferring heat from the refrigerant fluid being circulated inside tubing comprising said heat exchanger means, to said ambient outdoor air passing through said heat exchanger means over said tubing;

the second air flow path comprising a room air return inlet means in air flow communication with forced air flow means for directing the flow of room air returning from the space to be environmentally controlled, through the second air flow path, and back to said space through room air inlet means for discharging the flow of air exiting the second air flow path;

first heat exchanger means for transferring heat from the room air to the refrigerant fluid being circulated inside tubing comprising said first heat exchanger means, thereby cooling and dehumidifying said room air that has passed through said filter means;

second heat exchanger means, downstream of the first heat exchanger means, for transferring heat from the circulating refrigerant fluid inside tubing comprising said second heat exchanger means, said refrigerant fluid being at a raised temperature after exiting the compressor, the heat being transferred to the room air exiting the first heat exchanger means; and

the refrigerant circuit means further comprising:

anti-floodback control means for protecting the compressor from liquid refrigerant that may occur during low ambient temperature operation or under low load condition operation of the improved air conditioner system, said anti-floodback control means being located upstream of the compressor;

anti-migration control means for protecting the compressor from liquid refrigerant that may migrate from the tubing in said heat exchanger means in the first air flow path or from the tubing in said second heat exchanger means in said second air flow path, said anti-migration control means being located downstream of the compressor; and

expansion means for reducing a pressure of a liquid state refrigerant fluid leaving tubing in said heat exchanger means in the first air flow path to a desired pressure with a resultant corresponding cooler temperature of the refrigerant fluid so as to change the refrigerant fluid back to a gaseous state for entry into the tubing in the first heat exchanger means in the second air flow path, said expansion means being located

upstream of the first heat exchanger means and downstream of the heat exchanger means in the first air flow path,

wherein the refrigerant fluid circulates from the compressor through the anti-migration control means, through the tubing in the second heat exchanger means in the second air flow path, through the tubing in the heat exchanger means in the first air flow path, through the expansion means, through the tubing in the first heat exchanger means in the second air flow path, through the anti-floodback control means and back to the compressor to complete the refrigerant circuit means.

2. The improved air conditioner system according to claim 1,

wherein the refrigerant, upon leaving the second heat exchanger means enters the heat exchanger means in the first air flow path at an approximate condensing temperature and provides a change of state of the refrigerant from a gaseous state to a liquid state, causing a substantial sub-cooling of liquid refrigerant leaving the heat exchanger means in the first air flow path,

wherein the liquid refrigerant is at the reduced desired discharge pressure entering the expansion means,

wherein with the corresponding cooler temperature of refrigerant liquid, the liquid state of the refrigerant is changed back to a gaseous state by absorbing heat from the air passing across the first heat exchanger means in the second air flow path, and

wherein a latent dehumification capacity of the improved air conditioner system is enhanced by 25-40 percent.

3. The improved air conditioner system according to claim 1, further comprising filter means for particulate removal from the room air returning from the space entering through said room air return inlet means.

4. The improved air conditioner system according to claim 1, wherein the use of the second heat exchanger means in the second air flow path and the associated tubing containing the circulating refrigerant fluid of the refrigerant circuit means within the second heat exchanger means, and the anti-migration control means serves as means for further reducing a surface temperature of the tubes within the first heat exchanger means thereby creating additional amounts of moisture to collect on the surface of the first heat exchanger means and to be drained away from the system.

5. The improved air conditioner system according to claim 4, further comprising condensate drain means for removing the moisture accumulating on the tubes of the first heat exchanger means.

6. The improved air conditioner system according to claim 4, wherein the second heat exchanger means in the second air flow path is a hot gas re-heat de-superheater heat exchanger.

7. The improved air conditioner system according to claim 1, wherein the refrigerant fluid flowing from the second heat exchanger means in the second air flow path to the heat exchanger means in the first air flow path enters said heat exchanger in the first air flow path at close to a condensing temperature of the refrigerant fluid to provide an immediate change of state of the refrigerant fluid from a gaseous state to a liquid state, thereby causing a substantial sub-cooling of the liquid state refrigerant fluid leaving the heat exchanger means in the first air flow path.